AN EVALUATION OF HIGHWAY IMPACT STUDIES AND A PILOT STUDY OF BYPASS IMPACT ON BUSINESS ACTIVITY

An Evaluation of Highway Impact Studies and a Pilot Study of Bypass Impact on Business Activity

by

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for the

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INTRODUCTION

Present evaluation of highway bypasses consists mainly of allegations, quite often conflicting. Many are essentially unsupported by either systematic hypotheses, meaningful data, or empirical tests. There is a need to sort out what the facts of the case are, and to analyse some of the general propositions growing out of work to date. In addition, there is a need to view the highway impact research to date to ascertain its validity and usefulness, and to indicate the role and nature of highway impact research in the future, in relation to overall highway and regional planning.

In the light of the above, this study takes the following form.

1) A chapter in which the results of examination of the research to date are discussed and evaluated.

2) More detailed description of a number of studies, primarily to illustrate the first section.

3) A report on a small pilot study performed to check on research technique, and the usefulness of present data in the Department of Highways.

4) General observations and Conclusions.

INTRODUCTION

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4) [illegible] on [illegible].

Chapter One

GENERAL EVALUATION OF HIGHWAY IMPACT STUDIES

a) Objectives of Highway Impact Studies

In general, the objective of highway impact studies has been to assess the economic, social,and demographic effects of improving the road transportation facility, whether on a local, regional or national basis. More narrowly, highway impact studies have been designed to test the significance of highway improvements and evaluate the benefits or injuries of highway improvements to the area concerned through fluctuations in land value, alterations in land use, and changes in the level and character of business activity.

Basically, the concern here is whether a highway improvement such as the construction of a controlled access bypass causes non-vehicular benefits or injuries, aside from the effects of the change on actual users. It is clear that such an improvement directly affects the user of the road system through decreased cost of movement, greater safety, and reduction of travel time. However, these advantages must be considered in relation to the nature and extent of indirect effects on land values and use, and general business activity. In addition, there is the further issue to be discussed later, as to whether these indirect effects are separable from and not simply attributable to user benefits. That is whether or not there are any purely non-user benefits as a result of the highway improvement.

To the extent that indirect effects can be assessed, there are a number of immediate applications for such information, of which the following would appear to be the most significant.

Chapter One

GENERAL EVALUATION OF HIGHWAY IMPACT STUDIES

a) Objectives of Highway Impact Studies

In general, the objective of highway impact studies has been to assess the economic, social, and ecological effects of improving or new transportation facility, whether on a local, regional or national scale. More narrowly, highway impact studies may be designed to test the significance of highway improvements on available life expectancies or highway improvement on the area concerned through fluctuations in land values, either in land use, and changes in the level and character of economic activity.

Basically, the concern here is whether a highway improvement such as the construction of a controlled access system causes non-recreational benefits or disbenefits, either from the effects of the system on actual users. It is clear that such an improvement directly affects the use of the road system through development of convenient, greater safety, the reduction of travel time. However, these advantages must be considered in relation to the nature and extent of its direct effects on land values and other economic business activity. In addition, there is the further task of assessing, later, as to whether these indirect effects are essentially from and not simply substitutions to base conditions. This is important as we have see the problem of induced traffic as a result of the highway improvement.

In the review that follows attention will be focused, there are a number of two-fold approaches that have underlying, of which the following which appear to be the most significant.

1) Aid in assessing non-user taxation for distributing the highway cost over a broader base. Here the issue over whether or not there are any indirect benefits which are not a direct result of user benefits, is of prime significance. If all of the indirect benefits are a direct outcome of user benefits, then the necessity of spreading the cost over a broader base is eliminated, since assessing it on the users will work through the system to the indirect benefits as well, since they are directly related. In addition, it is questionable whether an indirect system of levies can ever be efficient as an allocating mechanism.

2) Assistance in providing knowledge required for assessing the comments and complaints received from the public on the location of highway improvements. The studies can provide somewhat more precise and accurate information to replace the subjective personal reactions which otherwise tend to be presented.

3) To provide information useful in making equitable decisions concerning right of way acquisitions.

4) Evaluation of the economic impact on urban and rural communities, and on different patterns of land use, should be taken into consideration in highway design and location, and highway planning in general. To the extent that highway changes and improvements create indirect effects, highway planning must take these into account if errors are not to be made. Highway planning based on existing conditions and patterns of land use and business development, with trends merely extrapolated from present patterns, may be seriously wrong if the highway creates indirect effects, since these effects will change the circumstances for which the highway was built and the use to which it

is put. For example, a highway bypass may, because of the influence of the indirect factors, become primarily an internal traffic route for the bypassed area and lead to further urban development around the highway which would not have taken place in that area without the bypass and its changed use because of pressure existing in the urban area. Such changes could result in a substantial change in the traffic loading of the bypass, so that, although adequate if it were to be used as a bypass, it becomes overloaded when the interaction of the bypass and the pressures created by the indirect effects work so as to alter the nature of the use of the bypass.

5) The pattern of development of urban and rural communities and particularly town planning proposals could be influenced by highway impact studies. This is related to point four. An urban plan which was conceived without knowledge or consideration of a highway improvement or bypass, could be substantially invalidated by the resulting change in land use, land values, and movement and density of traffic generated by a highway improvement in the area. A consideration of these two points suggests the need for considerable co-ordination between highway planning and urban and regional planning, otherwise the efforts of each might well be cancelled out by failure to consider the interaction of the two sets of plans. This point will be elaborated further in the report, as it would appear to be perhaps the most significant problem area in the research and planning of highway and urban developments.

With reference to the issue of user versus non-user benefits, critics of highway impact studies have argued that highway

improvement cannot offer anything more than transportation benefits, either directly or indirectly, and that it is therefore unrealistic and pointless to consider non-user or non-vehicular effects in studies. A fairly extensive analysis of this argument does seem to indicate that most of the benefits accruing indirectly, such as changes in land values or levels of business activity, can be directly related to transportation savings, with the possible exception of sales volume gains to a central trading area because of the reduction in congestion, and the resulting increase in the ability and willingness of people to shop in the downtown area. The increase in land values adjacent or near a highway improvement near an urban area might come about, for example, because the highway has now reduced the transportation costs, the shipping time, or the time for workers to get to the operation, in such a way as to induce a substantially higher level of industrial location in the particular area, thus leading to an increase in land values. However, it can be seen that this increase is directly related to the user benefits of the improved highway facility.

This suggests that there is no independent increase in activity caused by the creation of highway improvements, but that developments which occur are a result of restructuring and relocation within an area as a result of the change caused by the highway. One might compare the effect of a highway improvement to a string placed in a saturate solution of a salt. Crystals form around the string, but it is not correct to say that the string caused the crystals to form, rather that the placing of the string in the solution influenced the location and type of

crystal formation that took place. So it would seem to be with the influence of highways. However, it would appear to be a far step from this conclusion to a general ignoring of highway impact studies. The changes that occur, even if they are not independent, are certainly of significance for the region or area in which they occur, and are significant for the planning both of the highway and of the area. The fact that adjustments occur is sufficient reason for undertaking the studies. Evaluation of effects may be useful to explain to a particular urban area the real results of a highway improvement, as opposed to the ideas and myths which almost inevitably seem to spring up. More important information gathered, even if imperfect, will be of assistance in predicting effects of future improvements.

Given a reasonable balance of transportation facilities from area to area and region to region, the introduction of a highway improvement has its main effect in the local or area adjustments which take place. Thus impact studies have been, and in all probability should continue to be concerned with the relative shifts and adjustments which are caused within a relatively prescribed area, and should not try to chase the shadow of independent benefits of highway improvements to larger regions. Thus, the field of study should be limited to a local level where the impact is more obvious, direct, and significant in the planning and general development process. The wider the area considered, the more complex is the pattern, and it is more difficult and requires a much longer time period to determine any indirect effects.

b) Methodology of Highway Impact Studies

Three main methods are commonly used, either singly or in combination, in assessing highway impact: analysis of changes in land values; changes in land use; and changes in business activity.

Variations in land values and their association with highway improvements are generally analyzed by tracing actual land transactions and valuations for assessment purposes if these are available. In an attempt to isolate the highway effect from the many other factors which will influence land values, a comparative analysis is made. Generally, land values in certain areas adjacent to the new highway facility, and considered to be within its sphere of influence, are compared with land values in other areas similar in every respect except for the highway improvement. This method of using a test area and control area is very common for assessing the effect of highway improvement on land value. There are problems to this approach, not the least of which is data collection. In many areas the slow rate of land turn-over does not provide sufficient data to make a sound analysis. If the survey area includes improved land the valuations for assessment purposes will be available but a time lag is usually present between actual market value and the assessed value. Also, assessed values are not always consistent. Choosing a control area which will be representative and subject to the same conditions as the test area except for the highway effect is a difficult task which will influence the validity of the research findings. This task is particularly difficult with smaller population centers. Further, there are many other factors which can change land values, and are not related to highway improvements.

Irrespective of these criticisms, analysis of land value fluctuations is important for highway impact studies. There are in land valuations, actual measures of how persons have placed value on land as a result of the highway traffic and location. As the road network is altered land values may change, thus providing a measure of the value or benefit of the alteration as a result of the improvement. In this regard direct measurement is almost possible. Although, since individual decisions are involved, the possibility of differences in the reasons for attaching value may distort the results significantly; particularly in smaller centers where the sample is small.

Another method of analyzing the effect of highway improvement is the study of changes in the pattern of land use. This procedure involves the analysis of land use changes as alterations are made in the highway system. Typically this type of study operates from a very broad base and includes many facets of investigation. Two of the more extensive land use studies are the Route 128 Boston circumferential highway study and the Connecticut Turnpike study. Both of these research projects are very extensive in nature and they introduce many facets for analyzing the highway impact, the main theme being the structure of land use. These studies examine the influx of new industries and the reasons for plants locating on the new route, the development of commercial and residential areas, and the alteration of traffic flow. A land use study depends on many sources of information and often requires the use of personal interviews, questionnaires, visual surveys, analysis of land transactions and other techniques.

The major problem in using land use surveys to determine present and future effects of highway improvements is that the method is most appropriate when used on a large scale. Hence, it is expensive. Also, since it takes time to change the use of land, the analysis of the results of the highway improvement may take some years before useful information is obtained.

A properly constituted land use study is an integral part of any major planning project, whether it be for rural or urban highway improvement, but particularly for highway improvement near a major urban area. Because the building of a controlled access highway can alter the existing and future land use pattern of the affected area, integrated studies are necessary to coordinate expected urban expansion with changes caused by traffic volumes and the location of the new facility.

A third method of evaluating the effect of highway improvements is through comparing the pattern of business activity before and after construction of the highway improvement, and comparing this pattern with that of a similar community or area - similar that is except for the highway improvement. Indication of trends in business activity may be detected from various data, the most common one for highway impact studies being retail sales. The underlying assumption in this method is that the effects of highway improvements on any one community will be reflected in some way by variations in the gross retail trade of the community. Most commonly the type of highway improvement under consideration has been the controlled access bypass designed to carry transient traffic around instead of through communities thus avoiding

congested areas and allowing traffic to move freely from origin to destination. Logically, therefore, there will be a loss of business relating to transient traffic. However, the improvement in transportation may induce new industry to locate in the area thus increasing the volume of business. Reduced congestion will make shopping within the community more convenient and thus may draw additional retail trade from a wider area. The economic re-orientation which a highway bypass precipitates may be traced by studying fluctuations in retail trade. The indicator most commonly used is gross sales receipts. There is danger that the study, can conceal effects, which may cancel out in the overall result, yet be significant for sub-groups within the study area (i.e. peripheral service stations). Using sales information has the advantage of being more suitable for smaller scale investigations, giving an earlier indication of the impact of the improvement than either land use or land value studies. However, studies based on sales also have their limitations, and in the long run must be supplemented by other techniques. (These limitations will be indicated in detail in Chapter Three of this report.)

Data sufficiently detailed to analyse the effects of the highway bypass on types of businesses are not easily available. In many of the American States sales tax data are available and will provide partial or fairly complete data depending on the scope of the sales tax. As well as this many of the state licensing bureaus require all businesses to report gross sales, thus providing an excellent data source. What are the alternatives when no sales tax or license information is available?

The only real alternative to these data sources is through direct contact with the merchants themselves. If this proves impossible there are agencies which provide approximation of the total retail market for specific areas but this type of data does not yield nearly enough detail for an accurate analysis.

Measuring highway impact from retail sales fluctuations requires, as in the case of land value, some basis of comparison. The community or region under consideration should be compared with areas similar in all respects but for the highway improvement. This must be done over time before and after the highway improvement to detect any trends or alterations in the retail sales pattern.

c) Some General Considerations

Difficulties in comparing results of various bypass studies arise because of the nature of the bypass itself. Some bypasses are constructed at a considerable distance from the communities while others may cut through the area a short distance from the central business district. The proportion of local to through traffic may differ. There are other reasons which make comparison difficult, chiefly because of the nature of the affected communities, all of which depend on different contributing factors for prosperity and growth.

It is not unreasonable to assume that besides the economic nature of a particular community, the size of the community will also partially determine the net effect of a highway bypass. Usually, a very small community located on a main highway will

contain businesses which are largely highway orientated. That is, they primarily serve transient highway traffic, rather than local users. Eliminating the majority of the traffic will decrease business proportionately. As the community grows in size, the services it provides will become more diversified and the economy more complex, with less dependence on any one factor. Of course, individual firms which are highway oriented, located on the periphery of the community, and dependent on transient traffic, will have to readjust to the new traffic situation. It is important to remember, however, that in the great majority of communities, transient traffic contributes a varying but relatively small stimulation to the local economy and while some of this will be lost, economic ruin is certainly not inevitable, nor in most cases, likely.

Construction of a controlled access highway through an area, may cause a restructuring of the transportation system. Distant trading centers become more accessible and the influence of one city on its hinterland will increase. Naturally, refining and improving any transportation facility will have the effect of making distant points more easily available for commerce and recreation. Highway improvement as extensive as the construction of controlled access highways will certainly precipitate readjustments in transportation patterns, fostering the growth of certain trading centers and decreasing the sphere of influence of other central places. These readjustments are not necessarily a function of the transient traffic and could have a far reaching effect on the economy of the community.

This pattern is not new, for all major transportation revolutions have caused readjustments in the economic development of the country. To be sure the new modern highways are a refinement on an already extensive service and thus the effects will not be so far reaching as if the facility was newly created. However, the influence on any one area can be extensive.

It is well to note here that this indicates a difference in importance of studies of the impact of highway improvements, and the kind of planning suggested for highway developments, depending on whether the improvement is essentially a means of moving traffic more efficiently through a predominantly rural area, or whether it involves and intermixes with the traffic movements in an urban complex. This is particularly important the larger the urban complex, and the more acute the internal transportation problem within the complex. In the rural improvement, the primary consideration for planning can logically be confined to considerations of highway economics; designing a highway or highway improvement which will offer the least cost alternative in view of the transportation objectives. In the urban complex situation however, particularly with pressing internal traffic problems, the importance of impact studies, and more particularly, prior analysis and attempted forecast of interaction and indirect effects on land use and land values become the significant factors in the planning of the facility.

As indicated earlier in this section, unless this is the primary attention of the planning, the highway improvement is likely to influence readjustments in the urban area to such an

extent that it will interfere with the logical planning in the area, and also work to negate the highway transportation function of the improvement. A highway bypass, planned without the interaction and active cooperation of the urban and highway planners, can soon become so overloaded with internal use travellers and surrounded by urban residential and commercial development that its usefulness as a bypass route is impaired, particularly during peak urban travel hours. Further, the induced relocation of residential and commercial land use makes additional land acquisitions to correct the problem extremely difficult and expensive.

Because of the differences noted in the nature of communities and the factors working within them, the different types of bypasses, and the variety of adjustments which the the highway facility may necessitate, it is difficult to make specific predictions about the results which can be expected from a given bypass, just drawing on general conclusions observed from other studies. What is necessary is a specific analysis of the particular situation. The role that other studies can play is to provide a fund of general information on effects, and indications of probable patterns of community and business adjustments. These can then be fitted to the specific analysis of the highway improvement in the particular area concerned. In view of this, an examination of several of the more complete studies and some broad conclusions drawn from them and many smaller studies are give in the next section to aid in the accumulation of this necessary general knowledge of the effects and implications of highway bypasses, with particular reference to the scope of this study; retail trade.

Chapter Two

Summary and Conclusions of Four Research Projects and General Conclusions Drawn From a Large Number of Similar Studies

A. Introduction

In this chapter four studies of highway impact are examined in detail. These were chosen as representative of the range of past studies performed. In addition, conclusions from a larger selection of studies examined are included at the end of the chapter.

In the detailed studies the conclusions share a number of characteristics which substantiate comments in Chapter I about the limited usefulness and difficulty in drawing precise conclusions from highway economic research. These are: (1) The conclusions are not startling. An experienced analyst could be expected to draw similar conclusion without extensive empirical research. (2) Effects attributed in the conclusions to highway changes are substantiated by results in which the independent highway effect is not clearly separable. (e.g. all the conclusions from the Lexington Virginia Bypass Study. Specific comment will be made in parenthesis where appropriate.) Indeed, the attributing of these results to the highway improvement with any degree of certainty is very questionable.

In general, these studies should serve to illustrate the characteristics of this type of research, the conclusions which have been drawn, and the difficulties and general weakness in this area of investigation.

B. A Study of The Economic Effects of the U.S. Route 11 Bypass

The Effects of the Lexington, Virginia Bypass on Business Volumes and Composition
- by Joseph W. Harrison, Virginia Council of Highway Investigation and Research, Charlottesville, Virginia, October, 1958

This is a study of the economic effects of the U.S. Route 11 Bypass at Lexington, Virginia, a town with a population presently estimated at 6,500. The study was designed to investigate the effects of the Bypass on business volumes and composition.

I. Methodology: The primary source of data for the study was the business license application required by the State Department of Taxation. Information tabulated included identification of each business unit and its proprietor, the location, duration, type of business activity, and annual gross incomes. For the analysis annaul gross incomes data were used and a study period extending over six years was chosen. The selected period from 1952 through 1957 permitted the analysis of two year periods, before, during, and after construction of the bypass. The only major business group omitted was that composed of hotels, motels and tourist homes. (This is perhaps the most important group as far as highway impact is concerned. Its omission introduces a bias against adverse findings.)

Comparisons of business activity in the study and control areas over the selected time period were designed to detect the influences of the highway bypass. Defining study and control areas was a difficult problem, which required the selection of geographic areas containing approximately the same number of businesses, conducting similar activities, within like sociological and economic climates.

Three study areas were chosen.

a. Bypassed businesses abutting the old route (U.S. Route 11)

b. Businesses within the corporate limits of Lexington not including those in Chapter I

c. Businesses within the Lexington fringe area but not those considered rural in nature.

Three control areas were chosen.

1. Businesses located on an east-west route through Lexington. (The bypass route is a north--south highway.)

2. Roadside businesses located on Route 11 which were not bypassed by the new highway around Lexington.

3. Businesses within the corporate limits of a town similar in nature to Lexington.

II. Conclusion:

a. Firms associated with the typical central business district such as grocers, clothiers, and furniture and general appliance dealers, gave no indication that they were affected by the bypass. These businesses reported patterns of change of gross incomes which parallelled changes indicated for the state and the nation. (No proof that firms should have followed state or national pattern, bypass or not.)

b. Restaurant and automotive dealers reported a pattern of gross sales which indicated the influence of local alterations but which could not be attributed directly to the bypass.

c. Bypassed service stations in Lexington suffered decreased gross incomes after the traffic was diverted around the community. The maximum decrease of sales attributable to the bypass was 16%. This adverse effect was apparently fully dissipated during the two years after the

bypass was opened. (This still doesn't indicate whether the level regained was the level that could have been had the bypass not been built.)

C. The Economic Effects of Bypass Highways on Selected Kansas Communities by Hulse Wagner, Center for Research in Business, University of Kansas, Lawrence, Kansas, 1958.

The purpose of this study is to determine the location and the extent of the economic effects of bypass highways routes around selected communities. Basically this research project is an attempt to evaluate the following questions:

1. What types of individuals or businesses are affected when a bypass highway is built around a city?
2. To what degree are these parties affected?
3. Are the location and extent of the economic effects of a bypass such that they will exert a significant impact on the economic progress and future growth of the city concerned?

I. Methodology: The source of statistical data was the State Tax Division of the Department of Revenue which supplied information on gross retail sales for businesses in the four study areas as well as for the state as a whole. Highway orientated firms were defined as those which over half of the sales consist of the necessities of highway travellers. This study is based upon information which includes a nine year period, approximately four years on either side of the date of the construction of the bypass.

Analysis made with the data obtained were:

1. The sales of highway orientated firms were compared to the sales of all other types of firms.

2. The comparison and relation of the sales of the highway orientated firms were analyzed according to their locations on the old route, the bypass route, or in the other part of the city area.
3. The share of total city sales accounted for by highway orientated sales in general was evaluated.

II. Conclusions: This study has shown that in the four cities the economic effect of the bypass highway was chiefly dependent upon the general trend of the local economy and also upon the size of the city. Furthermore, the merchant most susceptible to loss of business from the bypass is the Old Route orientated sales merchant Generally the more rapid the growth of the city's economy and the larger the city's size, the less will be the potential economic effect of a bypass highway on the sellers of highway-orientated goods located on the old highway route. (All this really says is that if general growth is rapid and strong enough, the bypass effect is either masked or counterbalanced. This is still not drawing any sharp conclusions about the impact of bypasses.)

D. Geographic Impact of Highway Improvement - Changes in Transportation, Land Use, and Business Patterns, Concurrent with the Reorientation of U.S. Highway 99 in the Vicinity of Marysville, Washington.
by Garrison, Wm. L. and Marts, Marion E., Highway Economic Studies, The Department of Geography and The Department of Civil Engineering, University of Washington, 1958.

The construction of a network of highways as complex as the interstate system currently underway in the United States will undoubtedly effect the individual, the community and the nation. Studies such as this are designed for the purpose of assessing this effect, and using the knowledge in a variety of ways.

The Marysville study analyzes the effect of the bypass with reference to realigned traffic flows, results of personal interviews with businessmen, and comparison of business activity with a similar community (Mount Vernon). Extensive highway improvements through any given area will cause alterations in travel patterns, thus precipitating social and economic changes. Analyzing the old and new travel patterns should partially reveal the highway impact. Shifts in retail sales were also traced using the state sales tax data and land value trends were also studied.

General Conclusion:

1. There was a definite reduction in the amount of traffic through Marysville.
2. Access to a larger community to the south of Marysville (Everett) was improved with the new highway facility and there is some evidence that the shopping pattern changed with more people moving to Everett for certain goods.
3. The Central Business District of Marysville was definitely enhanced with the removal of through traffic.
4. The competitive position of Everett and Marysville has been changed relative to other communities to the north.
5. The construction of the bypass has enhanced Marysville as a residential centre.
6. Certain business operators have changed methods of merchandising or lines of goods and services offered and changed relationships with customers.
7. Changes may have occured in the interrelationships of service businesses, particularly to the north as the improved accessibility has bettered the competitive position of service activities.

(All these conclusions are ones that could have been expected. Also, conclusions such as 3 and 4 are very vague and it is difficult to assign any concrete values to them.)

E. Highway Bypasses and Their Effect on California Communities

The objective of the many studies conducted by the California Division of Highways has been mainly utilitarian in nature with a desire for immediate results. Presumably the reason for making land economic studies is to instill confidence and knowledge instead of opinions and conjectures which are bound to exist without knowledge of the true facts. Thus California has designed and conducted many studies which, while they are not extensive, have pointed up the immediate effect of the construction of a controlled access highway around an established community.

Major sources of information were land sales, sales tax returns and the personal interview. The general economy of the areas surrounding the test community was examined to detect any regional fluctuations. Comparisons are made between the trends in community retail gross sales with the general county receipts. Initially, it was felt that the personal interview technique would be a valuable source of information. A tabulation of all the information showed a wide variety of opinion on the effect of the controlled access highway. As an example of the inaccuracy found from the opinion survey, one retail business claimed that they suffered a 58 per cent loss after the construction of the access-controlled highway whereas the gross revenue which was reported for sales tax purposes showed a 3 per cent gain in business during that period of time.

In a separate study designed to assess the effect of highway improvement on the motel business, the personal interview proved reasonably successful however in this case the proprietors were asked specifically for gross sales data. Because of the time consuming nature of this method, the typical impact study will utilize some other source of data such as sales tax data, or land values.

Land Value: Success in using land sales as a guide in determining the influence of a new freeway depends upon a sufficient number of sales in both the study areas and the area or areas determined to be comparable in all respects but for the highway impact. If real estate sales are not sufficient in number to trace land values over the desired time period,then it is impossible to assess the effects of the highway improvement by this method.

Sales Tax Returns: As in the other states which have investigated the economic impact of highway improvement through fluctuations in retail business, California has relied on sales tax returns for the data source. All businesses are included except the service firms (including motels and hotels). This provides a reasonably wide scope for the studies.

Basically the methodology of the California studies is very simple and entails the comparison of the fluctuations of gross sales for retail firms in the bypassed community with the fluctuations of total gross sales in the surrounding county. Economic conditions of the area are examined and discussed qualitatively in all of these studies in an attempt to assess the highway effect alone.

Conclusions of three of these studies are included below. In each case these conclusions are attributable to the highway bypass.

1. Camarillo Study (population 5,000)[1]

(a) Land Values on the old route increased at a faster rate than similar property elsewhere in the community.

(b) Construction on the old route increased.

(c) All types of retail sales in the bypassed town increased at a greater rate than sales in the county.

(d) There was no indication of economic harm resulting from the highway bypass.

2. Templeton Bypass (population approximately 600)[2]

(a) Total retail business over the study time of two years (one year before and one year after the bypass) increased 4.13% in spite of a county business drop of 15.46%.

(b) Service stations, cafes, and bars (highway orientated firms) lost sales at approximately the same rate as the county.

3. Tulare Bypass (population 14,000)[3]

(a) Retail outlets catering to local trade and dependent on local buying power have experienced a greater gain than comparable business for the whole county.

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1. "Camarillo Study," by John F. Kelly. California Highways and Public Works, Vol. 34, Nos. 9 and 10 (September-October 1955) pp. 17-22+. Reprinted in Traffic Engineering, Vol. 26, No. 7 (April 1956) pp. 287-290.
2. "Templeton Bypass," by John F. Kelly. California Highways and Public Works, Vol. 34, Nos. 7 and 8 (July -August 1955)pp.23-27.
3. "Tulare Bypass," by John F. Kelly. California Highways and Public Works, Vol. 35, Nos. 5 and 6 (May-June 1956) pp.39-434.

(b) Highway orientated businesses have suffered some loss of business attributable to the bypass but the decrease has not seriously affected the community gain.

(c) There has been a steady upward trend in building activity and other indicators of growth since the town was bypassed.

(All the California studies are motivated by the legal requirement in the state for public bearings on all highway changes. As a result of this, as can be seen from the conclusions of the above studies, the studies appear to have a value primarily as public relations. The results, as with other studies commented on, are such that the effects of the highway improvement, as separate from general business changes, are difficult to identify in any precise quantitative sense. Indeed, one must question whether any true identification, even qualitative is possible in many instances, because the complex of causal forces hides the independent effects of the various factors.

General Survey of Bypass Impact Studies

General conclusions which can be drawn from the majority of the economic impact studies are difficult to catagorize on a group basis because of the different methodologies, community sizes, type of bypass, and other dissimilar circumstances. However, the majority of the studies followed formats which enabled many of the conclusions to be catagorized under several broad headings.

Table I classifies information from studies in a purely qualitative sense. This information indicates the effect of bypasses on retail trade and on land values in the designated communities on a purely no effect, gain, or loss basis. A gain

refers to an increase in business relative to similar control areas or in some studies - not as great a loss. A loss indicates a decrease in business relative to control areas or in some studies - not as great a gain. No effect, of course, indicates that the bypass had no impact on the communities retail sales volume or land values.

Table II classifies certain retail trade data with respect to highway bypasses quantitatively. The affected communities are listed by population rather than geographic location.

Conclusions from Studies Examined

1. Business activity appeared to have been either benefited or generally unaffected in areas bypassed by a traffic relief route. This is subject to the limitations on measuring the true independent effects which have been indicated above.
2. Of the 76 bypassed areas for which information about retail trade activity is available, 50 experienced either a greater increase or a smaller decrease than occurred in a comparable area which was not bypassed. Here the question must still be raised as to the precise comparability possible.
3. In many instances retail trade benefited from the highway bypass around the community.
4. In the case of purely highway orientated businesses sometimes there were increases in business associated with the bypass. This is true where there were no services provided on the new highway facility thus forcing the traveller to migrate to already established centres within the bypassed town.

5. Through travellers make up a much smaller proportion of a community's total business activity than is commonly supposed. Surveys show that a high percentage of travellers approaching large cities have destinations within these cities; on the other hand over 60% of the traffic approaching towns with population under 2500 passes on through the town.

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TABLE I

PROJECT	RETAIL TRADE: Highway Orientated +	Highway Orientated −	Non-Highway Orientated +	Non-Highway Orientated −	Located on Old Route +	Located on Old Route −	General Business +	General Business −	LAND VALUE: Old Route Value +	Old Route Value −	New Route Value +	New Route Value −	General +	General −	
Bypass-Nathan, Alabama		✓	✓		✓		✓		✓		✓				
Bypass-Stafford, Arizona							✓						✓		
Fresno, Calif.							✓				✓				
N. Sacremento					✓				✓		✓				
Auburn							✓						✓		
Fairfield		✓	✓												No Apparent Short-Run Effect
Folsom & Imperial							✓								
Escondado					✓				✓						
Temecula	No ill Effects														
Fairfield (see above)	✓		✓												Study Repeated 4 Years After Initial (One
Templeton	No effect						✓								
Camarillo							✓		✓						
Tulare					✓										
West Sacremento					No ill Effects need be Expected										
El Monte	✓		✓				✓								
Delano					✓								✓		
Bulleton							✓						✓		
Shell Beach													✓		
Anderson					✓				✓						
Motels (State wide)	✓									✓					
Colorado Community		✓				Decrease Rate of Increase									
Connecticut Turnpike							✓								
Lebanon, Indiana						✓					✓				
Abilene)															) No clear cut differences in the rate of
Beloit) Kanasas															) growth of various types of retail out-
Lawrence)															) lets. Highway orientated outlets on old
Wamego)															) route-slower rate of growth. Larger the
Fairbault, Minn		✓					✓								community, greater the benefits.
Rolla, Missouri					✓		✓								
Alfred, New York								✓							PERSONAL INTERVIEW - Study of 9 control
North Dakota															towns + 9 study towns-Bypasses have not caused any defects which would not have resulted from other circumstances
Oregon - Several Small Communities		✓													RETAIL BUSINESS LOSS DECREASED WITH SIZE OF COMMUNITY
Olneyville, Rhode Island							✓								
Hopkinton, Richmond, R.I.		✓													No abnormal change in land use
Tyndall, South Dakota		✓					✓								
Gulf Freeway on Houston											✓				
Dallas Central Expressway											✓				
San Antonio											✓				
Lexington, Virginia		✓					✓				✓		✓		
Economic Impact of Piece-by-Piece Opening		✓													
Marysville, Washington		✓					✓								
	3	10	4	0	7	0	17	1							

PLACE		POPULATION	YEAR BYPASS BUILT	LENGTH OF BYPASS BUILT	TIME PERIOD
Mayer	Arizona	44Z	1956	2.2	1955-57
Cannon Beach	Oregon	516	1952	3.2	1951-53
Templeton	Calif.	600	1952-53	0.6	1951-55
Gold Hill	Oregon	619	1953		1952-54
Oakland	Oregon	1017	1954		
Canyonville	Oregon	1139	1952		1951-53
Tyndall	S.D.	1292	1956		1955-57
Folsom	Calif.	1700	1949	7.3	1948-50
Imperial	"	2000	1949	0.6	1948-50
Anderson	"	2200	1950	0.6	1948-52
Hart	Michigan	2300	1955	10.0	1955-57
Marysville	Washington	2500	1954		1952-56
Sutherlin	Oregon	2737			1953-55
Area 1					1953-55
Area 2					1953-55
Zeeland	Michigan	3075	1956		1956-58
Hood River	Michigan	3701	1953		1952-54
Area 1					
Area 2					
Area 3					
Hopkinton)		3900)			
Ashawa)		1022)	1955	10.0	1950-57
Hope Valley)	Rhode	1000)			
Richmond)	Island	1900)			
Wyoming)		300)			
Olneyville)			1953		1949-53
Mason	Michigan	4210	1953	3.0	1952-54
Auburn	Calif.	5000	1947	2.0	1946-49
Camarillo	Calif.	5000	1954		1953-55
Fairfield	Calif.	5000	1949	4.7	1948-50
N. Sacremento	Calif.	6016	1947		1945-49
Lexington	Virginia	6500	1955		1952-57
Primary			1955		1952-57
Secondary			1955		1952-57
Roadside			1955		1952-57
Municipal			1955		1952-57
County			1955		1952-57
Escondado	Calif.	6600	1949	2.0	1948-50
Lebanon	Indiana	7631	1950	0.6	1951
El Monte	Calif.	8101	1956	3.9	1955-57
Delano	Calif.	8717	1956	4.0	1952-58
Polla	Missouri	9354	1954	5.0	1953-56
Tulare	Calif	14000	1953	7.9	1951-55
Niles	Michigan	14100	1956		1955-58
Faribault	Minnesota	18000	1955		1950-59
Adrian	Michigan	23070		3.0	1955-57
Temple	Texas	35000	1955		1954-57
Kokomo	Indiana	38672	1950	7.1	1951
Austin	Texas	185000	1954		1953-57

% CHANGES IN BUSINESS IN BYPASSED AREAS COMPARED WITH CONTROL AREAS

CAFES AND BARS		SERVICE STATIONS		HOTELS AND MOTELS		OTHER		TOTAL		AVERAGE ANNUAL % CHANGE	
B.P.A.	Cont	B.P.A.	Cont	B.P.A.	Cont	B.P.A.	Cont	B.P.A.	Cont	BPA	Cont
-21.2				156.0		520.8		38.9	10.2	19.5	5.1
-24.5		-4.4		24.8		7.3		5.5		2.8	
-33.0	-25.3	-13.1	-14.9			5.6	-14.7	4.1	-15.5	1.0	-3.9
-49.2		-38.6		-17.7		-9.4		-24.4		-12.2	
-5.8		-17.8		-8.5		-2.8		-6.6		-3.3	
-15.7		-9.4				3.9		-0.2		-0.1	
								-10.7	-17.4	-5.4	-8.7
1.2	-6.2	0.5	-4.6			0.3	4.3	1.0	2.7	0.5	1.4
-14.9	-16.4	8.0	5.3			-6.7	-7.2	-6.2	-6.8	-3.1	-3.4
43.1	-10.3	32.2	-0.4			34.1	19.6	35.0	15.0	8.8	7.5
-18.6	-0.2	10.1	9.0					3.1	-1.0	1.6	-0.5
-16.3		0.2									
-42.6		-15.2		-9.2		13.0		-5.1		2.6	
24.5		24.5				5.0		7.3		3.7	
-3.7	-0.5	2.5	1.8					-0.4	-9.8	-0.2	-4.9
-15.0		-16.2		-15.3		26.0					
-1.3		1.8		-12.5		-3.5					
-7.1		14.7				-1.1					
-77.8	9.4	-22.2	29.9			88.9	-1.7	36.8	10.3		
								-1.2	2.3	-0.3	0.6
-14.2	1.7	37.7	9.2					5.6	3.1	2.8	1.5
-23.0	-27.0	4.2	-21.4			-1.7	-1.7	-4.2	-6.6		
2.3	-2.3	5.6	3.6			6.1	5.6	5.6	4.8	2.8	2.4
-30.0	-5.6	-33.0	-9.8			22.6	8.5	4.5	5.0	2.3	2.5
-14.1	-25.6	4.6	-13.1			16.7	0.5	12.1	-4.1	3.0	-1.0
-12.2		-25.4									
-3.7		88.9									
	-21.6		45.4								
	41.6		64.3								
	13.3		53.0								
-2.2	-14.1	1.9	-23.7			20.0	7.3	17.8	3.2	8.9	1.6
-14.7		-25.1		30.0				3.7			
47.7	8.8	18.9	8.9			5.6	3.1	7.4	3.8		
								-6.8		-1.1	
-13.9		-10.1		11.0		24.6		10.8	22.3	3.6	7.4
-11.3	-14.8	-29.6	-7.4			46.6	-0.7	19.8	-4.4	5.0	-0.5
		10.1	0.9					-2.7	-10.1	-0.9	-3.3
-5.7		-6.8		65.0				13.0	14.0		
		-0.5	6.8					0.7	-0.9	0.4	-0.5
-18.4		-14.8		-56.4		-3.2			-15.5		-5.2
-1.7		-2.4		-15.0		12.4		-4.4			
-37.2		-1.6		-34.3					-0.7		-0.2

CHAPTER III

Preliminary Pilot Study of the Economic Impact of Highway Improvement

A. Initial Investigation Into the Economic Impact of Highway Improvement - Research Technique

Before any attempt is made to investigate the impact of highway improvement on a large scale, it is logical to initiate the investigation with a limited pilot project. The purposes of such a study are:

1. To test the feasibility of the type of research.
2. To develop a methodology which when expanded to a larger scale, will yield results from which general and useful results can be drawn.
3. To provide a basis for the final design and scope of the research project.

Primarily the problem centres around obtaining relevant data which can be used with a reasonable amount of assurance that it is accurate and of sufficient quality to be representative. In all of the useful studies performed to date the main data source has been sales tax records obtained with special permission from the state agency concerned. Permission to use this confidential information was usually obtained with the understanding that business volumes would be presented in the aggregate and fluctuations reported as percentage changes to avoid disclosure of confidential records.

A sales tax was not implemented in Ontario until September, 1961, thus eliminating this as a potential source of data for the

present study. Moreover, much of the most useful sales data will not be obtainable through sales tax returns, since gasoline, accommodation, and most meals are exempt from the sales tax. Alternate indication of business trends are available, such as number of retail trade establishments, business starts and terminations, employment in retail trade, traffic and parking conditions, bank deposits, land values, and land use charges. However, none of these are as sensitive to business fluctuations as gross receipts. To obtain this information it was necessary to turn to the merchants themselves for data.

Because the individual firms in the pilot test area were to be asked for periodic sales receipt data it logically followed that additional information might be obtained from a personal opinion survey and it was decided to include this in the pilot project.

Geographical areas had to be chosen for the pilot study which would be representative of the typical bypassed community, and include retail establishments likely to be affected by the rerouting of through traffic. The survey was limited further to highway oriented firms (service stations, motels, and restaurants) in the chosen areas.

Area of Study:

Area I - Includes the firms fronting on Highway 2 from the Kingston traffic circle to approximately one-half mile west of the new Highway 38 cut-off (see Figure 1). Highway 401 north of Kingston from Highway 38 to Highway 15 was opened November 9, 1957, thus providing a route around the city

and bypassing many of the firms located in Study Area I. There are several highway oriented businesses within this study area which have not, as yet, been bypassed by the new controlled access highway. Located on Highway 2 west of New Highway 38, these firms were intended as a comparative group which at that time had not been subjected to a decrease in through traffic. There were three motels and two gasoline outlets in this area.

Area II - In August 1960 a number of firms forming the hamlet referred to as Welcome on Highway 2 just west of Port Hope were bypassed when Highway 401 was located one-half mile south of the old route. The town of Port Hope was not bypassed until August, 1961 (see Figure 2). Study area number 2 includes the Welcome complex and the firms located on Highway 28 - Highway 2 junction in the centre of Port Hope to the outskirts of the town. At the time of the survey these firms had not been bypassed and it was hoped that others would serve as a comparative area if the quantity and quality of data collected were sufficient. The survey was performed just prior to the opening of Highway 401 around the area and a personal survey was taken after the highway bypassed all of Port Hope. There were three motels, two gasoline outlets, and a general store in the bypassed area. There were four motels, four gasoline outlets, and three restaurants in the control group.

A questionnaire and accompanying letter (see Appendix I) were sent to the merchants concerned followed by a personal interview

several weeks later. Retail sales receipts by month back to 1955 or as far back as possible were the only specific information asked for, the remainder of the questionnaire being for general opinions and comments. Rather than asking carefully defined questions about the bypass it was felt that more accurate and less biased information could be obtained if the merchants were to give their general views and experiences with the new highway without initial prompting. This approach lead to many interesting and informative discussions with motel and service station owners that might not have resulted had the questionnaire been composed entirely of specific requests for information. The merchants were assured of complete anonymity and if they chose, could present the data as percentage charges from year to year, using 1955 receipts as the base.

Another source of data was sought after through the oil companies with marketing facilities in the study areas. A request for information was sent to the chief marketing executive of eight major oil companies asking their assistance by providing gasoline sales (in gallons) at certain specific outlets from 1955 or from the date of opening, if the facilities were less than six years old. It was hoped that this information would provide additional data for assessing the effect of the bypass and also would serve as a check on data and opinions obtained from the actual service station owners or lessees.

Cooperation was received from most of the major oil companies, although several important to the survey did not, either not complying at all or giving insufficient data. From the companies

cooperating, the data indicated that the bypassed stations initially suffered a sharp decline, varying with the amount of dependence on non-local customers. This was followed by a movement back up towards previous levels. However, in some cases, the stations initially were favored by a sudden, and substantial increase in business when the highway bypass terminated near them, before 401 was completely linked through the area.

Thus, in the Port Hope and Kingston areas, merchants in the control area had booming gasoline sales since they represented temporarily either the first or last stations off the bypass. Once the bypass was completed, a very substantial sales drop took place. These stations would not return to their high sales during the temporary rerouting. They tended to return to patterns of sales that had been experienced in "normal" circumstances before the partial completion of the bypass gave a temporary impetus to extra sales. Some complaints were received about the drop in business that would not be recovered, but such complaints appear to be completely unwarranted. The operators experienced a fortuitous sales increase which was merely a function of the construction phase of Highway 401, and could not expect to retain this increase in sales volume. The extent to which sales moved back towards pre-bypass levels depended greatly on the size of the local area and the amount of business activity attractive to through travellers. Thus station areas with a large motel and business complex tended to return to normal conditions but stations in,for example, the Welcome area, which previously existed because of the highway intersections, did not come back to previous levels. The switch of traffic to 401 left the area, in effect, with a substantially reduced reason for existence.

From the Department of Highways of Ontario specific traffic data and results of Origin-Destination surveys were obtained. Successive Origin-Destination surveys around a centre such as Kingston may eventually prove to be the most effective method of detecting the effect of highway improvement on a central place. It is hoped that by studying the result of Origin-Destination Surveys, alterations in traffic movement may be detected which can be attributed to the new highway facility. In the concluding chapters, suggestions will be made for improving these surveys as a source of impact data.

B. Initial Investigation of the Economic Impact of Highway Improvement - Research results

Because a prime objective of this pilot study is to evaluate the feasibility and methodology of highway impact research, consideration will be given to the problem of data collection.

Study Area I:

A total of twenty-five firms, catering primarily to the motorized public, were asked for their cooperation through the letter and questionnaire in this area. Of this total, twenty firms were located on the section of Highway 2 which had been bypassed with the remaining five fronting on Highway 2 west of New Highway 38, and consequently still on the main traffic artery. Table 1 summarizes average annual daily traffic, with the location number referring to Figure 3. Because the controlled access highway is completed only a few miles west of Kingston it is impossible to derive an accurate traffic figure indicating the number of vehicles moving around the city. Data from the internal traffic survey being conducted in Kingston, counted with

external vehicular movement information should provide a reasonably accurate picture of traffic behavior in and around Kingston. With just the present information available from the Ontario Department of Highways on external traffic, it is not possible to obtain any accurate indication of the proportion of traffic which bypasses Kingston. A substantially greater number of check points, at both sides of all points of access are necessary before this can be ascertained. Before discussing the problems of data collection by this method a summary table follows outlining the degree of success which was attained.

Table I - Details of Survey in Area I

	Bypassed	Not Bypassed
1. Number of Questionnaires mailed	20	5
2. Number of Personal Interviews	16	5
3. Statistical data obtained	5	2
4. Statistical data obtained in sufficient quantity for analysis	2	2

There are many contributing factors to this obvious lack of success in collecting past records of retail sales receipts. The most important of these contributing factors are:

1. The continuity of ownership had been broken in recent years or the firm was newly established.
2. Records of monthly gross sales were not available over an extended period.
3. The merchants concerned were in their most active period and time would not allow them to search through past records.

4. Refusal to disclose confidential information (very infrequent).
5. It was impossible to contact the owner or the manager for reasons of illness or extended absence (rare).
6. Inadequate records, a common characteristic of small businesses, which composed about all the firms studied.

Because the data collection process was not successful, does not mean that the merchants were not cooperative and interested in the project. Almost all of the persons interviewed displayed keen awareness of the problems imposed by the new highway facility and were willing to discuss, often at great length, these and related aspects of their business. Through these personal interviews, some general conclusions were drawn about the merchants' opinions as to the effect and possible future effect of the highway bypass. These opinions by no means serve as evidence as to actual effects of the highway because they are firstly opinions and secondly the survey was limited to highway oriented firms, many of whom depend on several months of heavy tourist traffic for their existence. Obviously this constitutes a very limited sample but if the highway bypass is to cause injury these types of firms located on the periphery of an urban complex should be the most severely affected.

1. There was a distinct difference of opinion as to the effects of the new route between the firms in the bypassed area and the firms in the non-bypassed area, primarily because of the location of the access road (Highway 38) linking Highway 2 and Highway 401. Firms not yet bypassed (located west of Highway 38 on Highway 2) are concerned as to the eventual effects of the new highway facility when it is completed and they are bypassed. At that time all of the access roads to

Kingston from Highway 401 will be east of their present locations. Thus, transient traffic, including tourists, will be exposed to the facilities close to and within Kingston before passing by them.

2. Firms located in the section designated as the non-bypassed area have had a boom period because of the temporary relationship between Highway 2 and 401. For many travellers the service stations, motels, and restaurants located along this section of Highway 2 present either the first or last facilities before entering or leaving Highway 401. There now exists an added impetus over the usual influences for travellers to use these facilities which will be removed when the controlled access highway is completed west of Highway 38.

3. Highway oriented firms located in the bypassed area have generally detected no alterations in business activity which could be attributed to the highway bypass. A large majority of the opinions registered by the owners or managers of firms along Highway 2 contained little evidence that business had suffered because of the new circumferential route. Several service station owners expressed the idea that their sales were directly related to the number of automobiles passing by their door and felt that once the controlled access highway was completed across Ontario, their gross receipts would suffer. It is noteworthy, however, that there were no condemnations of the new highway facility which is significant particularly in an era of rapid expansion of facilities catering to transients (approximately one hundred new motel and hotel units have opened in the Kingston area during the past two years. (A unit is one room or a suite of rooms.)

4. Because a large proportion of the firms interviewed depend to such an extent on tourists for their existence, considerable discussion centred around services for this segment of the market. An urban complex which offers varied and extensive services, with subsequently less dependence on through traffic for prosperity, will not suffer to the extent that a small highway oriented community will when a bypass is constructed. This thesis seems to hold for the Kingston area which offers a rather diversified assortment of tourist attractions. The completion of Highway 2 across Eastern Ontario was often the topic of discussion, with many people expressing the opinion that sight-seers prefer the more scenic route of Highway 2 over the utilitarian aspects of Highway 401 and that if tourists are encouraged to use this route, any injury caused by the controlled access road would be partially erased.

Highway Location Number	Map Location	Average Annual Daily Traffic by Year					
		1955	1957	1958	1959	1960	1961/62
2	A	9500	11,500	9500	10,000	11,000	
2	B	4800	6,000	6800	6,800	6,800	
2	C	4800	6,000	6800	7,500	7,500	
38	D		1,000	1800	3,000	3,400	
401	E			2200	3,000	3,800	
401	F			2200	4,000	4,800	

TABLE 2

Average Annual Daily Traffic by Year at Locations West and North of Kingston. Source - Department of Highways of Ontario.

NOTE:
1. New Highway 38 opened November 9, 1959.
2. Bypass around Kingston from New Highway 38 to Highway 15 opened August, 1958.
3. Highway 401 from Highway 15 to Gananoque opened August, 1959.

Study Area II:

Included in this study area are two types of retail complexes, one which is obviously oriented to highway transient traffic, while the other is dependent to a much larger extent on traffic generated by the Port Hope service area. The original intention was to use the non-bypassed area as a control for comparison with the bypassed area of Welcome if enough data were collected. Table 2 summarizes the average annual traffic with the location numbers referring to Figure 3. The impact of Highway 401 as a road by-passing Welcome is easily discernible from this data. In 1959 the average annual daily traffic count through Welcome was between 5000 and 7000 vehicles, dropping to between 1400 and 1700 in 1960. Obviously a community catering to highway traffic will suffer when traffic volume of this magnitude bypasses the area. Gathering retail sales data from the merchants in Study Area II met with approximately the same results as did the collection process in Study Area I.

Highway Number	Map Location Number	Average Annual Daily Traffic by Year						
		1953	1957	1958	1959	B 1960	A 1960	1961
2	G	3400	3900	3700	5000		1700	
2	H	5900	6000	6300	7000	6800	1400	
106	J	4400	3000	2800	3200	3200	850	

TABLE 3

Average Annual Daily Traffic By-pass at Location in the Welcome Area

NOTE:
Highway 401 south of Welcome opened August 1960.

TABLE 4

Details of Survey in Area II

	Study	Control
1. Number of questionnaires mailed	5	11
2. Number of personal interviews	5	8
3. Statistical data obtained	2	1
4. Statistical data obtained in sufficient quantity for analysis	2	1

Reasons for failure to obtain statistical information of sufficient quantity for analysis were approximately the same as for Study Area I and occurred with almost the same frequency. Once again however, the merchants were most cooperative, discussing the various aspects of the project. As was mentioned previously the town of Port Hope was bypassed very soon after conducting the personal interview in that area. Consequently, several of the more cooperative merchants were again solicited for their opinions on the effect of the bypass. This met with only a small degree of success.

Without statistical data any conclusions drawn from this portion of the investigation are open to skepticism, however,there are certain statements which can be made on the basis of the study in Area II.

1. Welcome, a small hamlet catering to transient highway traffic, was severely affected by the construction of a controlled access highway located approximately one mile from the old route. Evidence of this is provided by the sale and attempted sale of three of the five businesses surveyed in this area

within one year of the opening of the bypass, Previously these businesses were strategically located at the junction of Highway 2 and Highway 106, both main arteries carrying considerable traffic. The complex developed to service transients and not to serve local needs. Personal surveys and visual observation was adequate in this case for making the judgment that Welcome was obviously affected by the bypass.

2. What the impact of the highway improvement has been on the firms located on the eastern section of Port Hope along Highway 2 is almost impossible to predict from the limited survey performed to date. This area does not present the diverse attractions which Kingston provides to tourists and the town of Port Hope serves a considerably smaller population, both rural and urban. Again, as in the non-bypassed area west of Kingston, the highway oriented firms on the eastern side of Port Hope enjoyed an unusual boom period between July 1960 and August 1961 because of the particular construction pattern of Highway 401. These firms afforded the first and last opportunity for services on leaving or entering this controlled access highway thus realizing a temporary surge in business volumes, decreasing again when the section north of Port Hope was opened.

Motel owners located on Highway 2 east of Port Hope's central business district expressed relatively little concern for the effects that the new highway facility would have on their business volumes, an opinion not generally shared by the service station group who believed there would be a decrease in gasoline volumes with the opening of the new facility. Retail firms catering primarily to highway traffic and located on the periphery of a

community can expect a decrease in gross receipts and therefore this opinion may not be unrealistic for several of these service stations.

With regard to the data which was collected, the number of firms is small enough that publishing of the data would raise the possibility that individual firms could be identified from the data. This would violate the assurances of anonymity given the cooperating merchants. However, the data collected substantiates conclusions indicated above and results of studies reviewed in Chapter II.

The damage to be expected from a highway bypass is very significantly related to the size and internal business attractions and activity of the community. It appears reasonable to say that in any given area, the bypass will only divert traffic which would normally not have stopped in the community without the bypass, except for emergency refueling, repairs, or snacks. Thus traffic moving from say, Toronto to Montreal on Highway 2 prior to the completion of 401 would not typically stop in small communities along the way on a regular basis. Kingston, Brockville and Belleville, on the other hand, have enough services, stores, and attractions, and are located at such a point in the trip, that stops would tend to be made both when using the old route, and with 401 completed.

Thus the only injury of significance to be expected is to those outlets, particularly food and gasoline, which were dependent on casual, almost accidental business from transients. In addition any locations, both food and gasoline, and motel as well,

which were poorly located in the first place, would tend to be injured by construction of a bypass. Thus motels stuck in the middle of the country along No. 2 Highway, not near any attractive urban complex, and not located at a logical stopping place for travellers, would tend to face a reduction in an already low volume of business sufficient to probably eliminate them. This does not appear to be reasonably assessed against the bypass. It would have merely hastened a somewhat slower attrition rate, mainly a function of poor location in the first place.

The data which was collected substantiated (1) the lack of significant injury to businesses located in logical locations; (2) the sudden spurt in sales and return to "normal" following partial completion of the bypass; (3) the rather more serious impact on highway dependent outlets in fringe locations.

In general, the study, both from the personal surveys and the data collected, indicates that the overall effect on highway oriented business is modest. Taking these businesses as the most sensitive to the effect of the bypass, it would appear fair to conclude that the overall effect on business in the communities concerned was at least neutral, and perhaps positive. The reduction in congestion, the orderly routing of traffic, the extension of trading areas, will bring advantages to the central urban areas that should more than balance the loss in fringe areas, as indicated in other studies.

CHAPTER IV

Conclusions and Observations

In each of the foregoing chapters, conclusions were drawn and observations made at appropriate points along the way. In this chapter then, we just wish to restate and highlight what are perhaps the most important observations and conclusions. In addition, some elaboration of several of the observations will be made.

This summary will attempt to break the observations down into three areas. (1) General value of impact research, and general conclusions to be drawn about the impact of highway improvements. (2) Specific observations as a result of the pilot study. (3) Suggestions for further work and improvement of existing data. It must be kept in mind that some overlapping will tend to occur between these areas.

A. General Value of Impact Research

1. Problem of independence of impact studies from urban planning. As indicated in the body of the report, there is a real problem in trying to separate out and carry on highway impact research independent of urban regional planning. In view of the difficulties of obtaining valid, independent data, it is questionable whether further highway impact studies, by themselves, are of enough value to justify the costs involved in a proper study. Studies already carried out provide an adequate fund of information and general principles. The only circumstances under which impact studies would appear valid would be (1) where they are

carried out as an integral part of an urban planning program, or (2) where for political reasons, it is necessary to establish facts concerning the impact of a bypass, to replace conjective and emotional reaction.

2. Non user Benefits. A large part of the original motivation for impact studies came from the desire to develop a basis for assessing benefits of highway improvements direct against non-users to the extent that they benefitted. Two points are relevant here: (1) Studies have not produced data, nor are they likely to, of sufficient sophistication to make any assessment against non-users. (2) Further, it is questionable whether there are any non-user benefits which are independent of user benefits. Given this, the charges for the highway improvements can be assessed solely against users (i.e.: in vehicle and gas taxes), with non-users paying through the inclusion of these charges in user costs. Thus, if an improvement lowers transport costs, which benefit both user and non-user, a charge against the user, say a trucking firm, will be borne also by the firm or person who uses these services; thus the non-using firm will also be paying for the services.

3. Data Problems. Another motive for the studies was to attempt to establish criteria for fair compensation to holders of land expropriated for highway improvements. It cannot be said that this has been achieved. Data on effects of improvements on land values and business activity, as indicated, are not such as to be able to clearly identify the separate impact of highway improvements. As indicated in the examples in Chapter II, the most that can be drawn from studies are general indications and observations. There is too much interaction of a wide variety of causal factors for analysis data to assess definitely against highway improvement uniquely and separately.

4. Size Factor and Impact. It would appear that in general the larger the size of a bypassed area and the greater the variety of business activity the less the area will be affected by the bypass. The larger and more complex the area, the more self sufficient it is, and less susceptible to changes in through highway traffic. In general it would appear from studies conducted that through traffic is a relatively unimportant factor in the business life of an area, except in the case of firms which depended almost completely on transient rather than area traffic for their business.

Difference between urban and rural areas. It should be observed in connection with the above that there is a difference between the problem of planning highway improvements through predominantly urban and rural areas. Through rural areas, the present pattern of attempting to plan the most efficient route between major points is all that is necessary. For this, the present system of traffic counts and origin and destination studies conducted by the Ontario Department of Highways provides satisfactory data. When the improvement runs near or through an urban area of some size, then the improvement influences and is influenced by the urban traffic pattern and land use, and integrated planning must be carried out between urban and highway planners.

The above points concerning the impact of highway improvements on business activity must be modified by one further factor. The business which is poorly located, planned or run, without regard to the improvement, will tend to show an accelerated effect. If the business was poorly located in the first place, then, a bypass,

say, may well have a very sharp effect, but this should not be attributed to the bypass, which has merely amplified an already poor business decision.

B. Pilot Study Observations

1. Extent of impact on area. In general, it appears reasonable to conclude that the impact of Highway 401 on bypassed areas has not been severe.

2. Size Factor. In this area, the general observation that the impact reduces with the size and complexity of the area bypassed definitely seems to hold true. In areas such as Kingston, the businesses studied, showed little impact in general, while in a small area such as Welcome, the businesses were definitely affected. Again, as indicated above, businesses poorly located in general, too highly dependent on one source of customer for their revenue, were affected much more sharply than other businesses located where a variety of services tended to attract customers.

In view of the fact that highway oriented businesses were studied, the relatively mild effect observed here indicates that for the communities as a whole, the bypass effect was unimportant, indeed probably posi ive in some cases, since advantages such as reduced congestion improved operations in the central business districts of the communities bypassed.

3. Merchants Attitudes. In general, merchants did not react strongly against the bypass. It appeared to be accepted as one of the facts of life within which one had to operate.

4. Data Collection. As was indicated, collection of data was difficult. However, even if it had been good, it is questionable whether any more could have been firmly established, because of the interdependence of causal factors, and the variations caused by individual variations in business skill and location.

5. Highway 2 as a tourist route. This appeared as a strong request by merchants; that Highway 2 be promoted and developed as a tourist route, perhaps in conjunction with Highway 33. This appears possible to capitalize on as tourists tire of Highway 401, which is essentially geared to fast movements of traffic, rather than touring, and would seem to be desirable for the general area.

C. Suggestions as to Future Actions

1. Data. The Origin and Destination studies of the Ontario Department of Highways need more detail to be used for impact study. They need to be conducted more often in areas to be studied, and should indicate the exact reason for the trip, not just place it in general categories. Also, every effort should be made to firmly establish whether a stop at a point is permanent, end of trip, stopover, or end of one way or a return trip. It is also suggested that the survey be taken by means of a statistical sampling procedure over a several day period, rather than stopping a whole series of cars at once, then letting many go through. This should be done at as many different times in the year as there is reason to expect a difference in the composition of traffic as far as reasons for travel are concerned.

With regard to the traffic counts; there need to be more check points. For example, on the counts at the west end of Kingston, there was a need for check points at all points of egress and exit, if change of traffic flow due to a bypass is to be measured. Otherwise, as with existing counts at this area, traffic is lost in the sense that larger aggregates are measured and traffic is lumped in such a way that it is impossible to determine the degree of bypassing.

2. Study of Highways 2 and 33. In view of the circumstances a study of Highways 2 and 33, as to their possibility as an encouraged tourist route, appears to have merit. This study should encompass, a survey of available accommodation and facilities, tourists attractions, and roadside facilities. A survey of tourists in the area to develop material both as to reasons for coming, and details concerning needed improvements should also be included. From this could be developed ways of promoting the route, forecasts of additional traffic and facilities needed, and means of possible association of communities to promote the area could be explored.

3. Emphasis on Need for coordination. It cannot be too strongly re-emphasized that future studies be integrated with urban planning for bypassed cities. It appears most important to make sure that Highway Department planning of highway improvements complements rather than confuses urban area planning. Otherwise the improvement itself may be defeated in its purpose, aside from the possibility of chaos on urban streets and in urban land use. If the improvement is planned independently, rather than being say an urban bypass route, it may become an urban intra-city route, defeat the bypass purpose in the process, create heavy

congestion on contiguous urban roads, and cause urban growth in patterns not thought desirable nor planned for by urban planners.

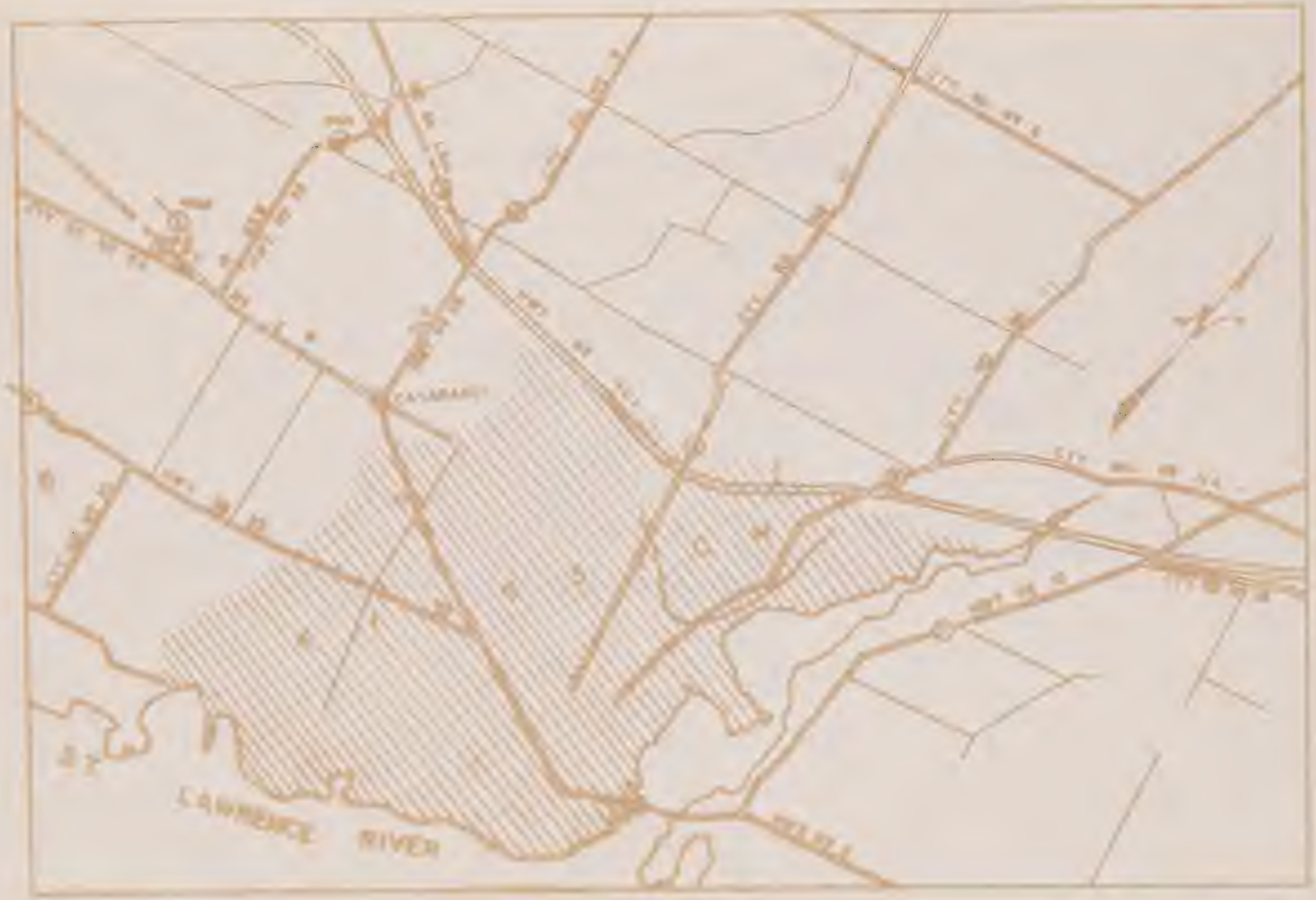
No urban planning nor highway planning of urban bypass routes should be carried out without reference to the other. There must be continual contact and coordination if the highway improvement is to do the job for which it was intended,and not create adverse side effects for urban planning.

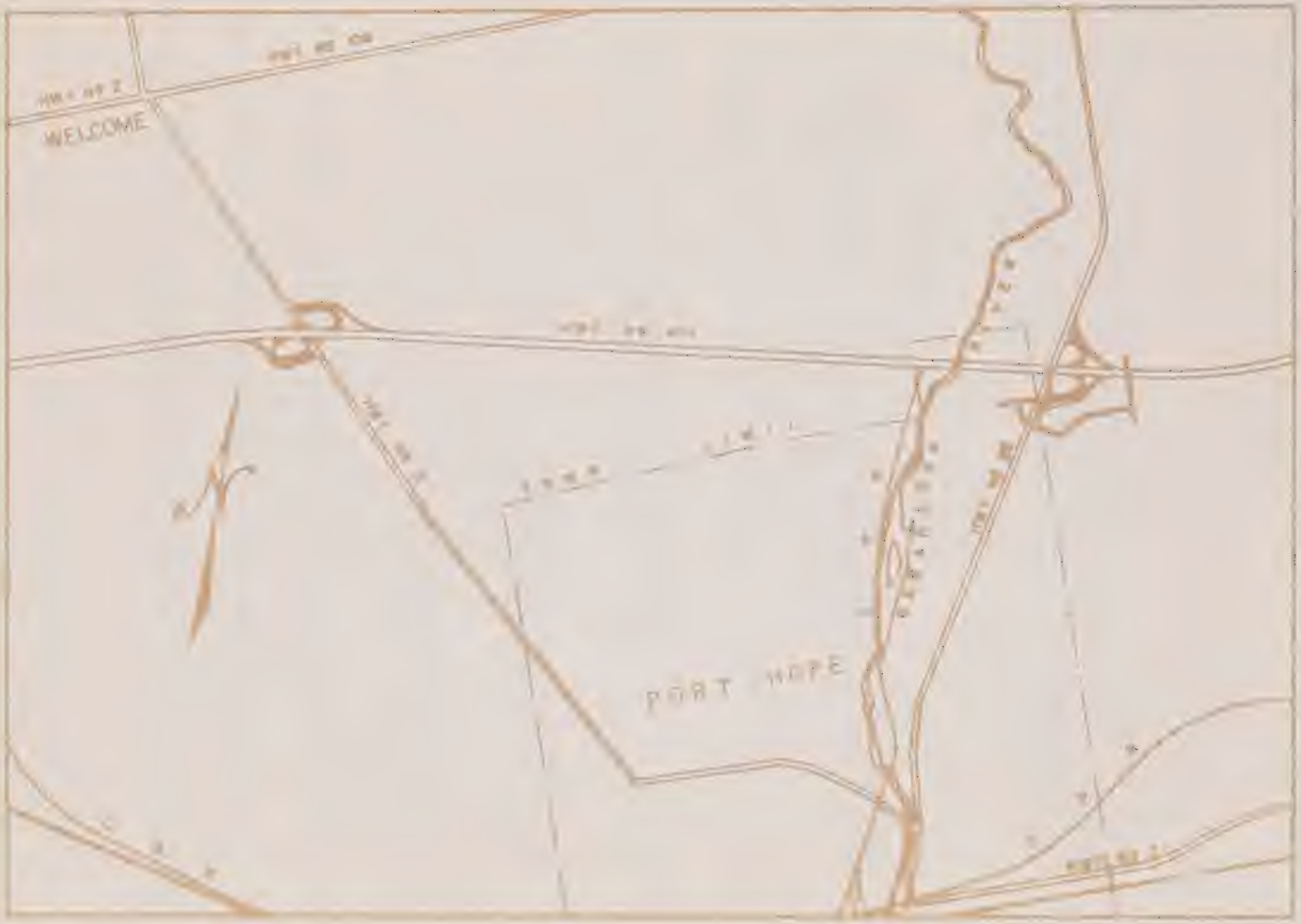
Appendix - Maps

1. Western area of Kingston - Study area #1.

2. Detail of #1.

3. Port Hope, Welcome area - Study area #2.


CAMBRIDGE RIVER


WELCOME
PORT HOPE

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